

[Note: This file contains proposed changes to C411.1, C411.2, and the first paragraph of 411.3.

The issues in C411.1 are potentially significant and in working with a few people it was not possible to come to consensus on one set of suggested language. This file presents C411.1 issues and then presents 3 possible revisions to address them.

The issues in C411.2 are also significant but the fixes were not controversial.

#### Issues with C411.1:

1. A building that does not qualify for the C411.1 exception 2 but doesn't have available roof to install the required solar has limited or possibly no options. This starts to be a problem above 10 floors but becomes a big issue above 20 floors. Currently the only recourse is to comply via C407 - or not depending on mandatory language change there. I think there should be an exception. See C411.1 options 1 and 2, exception 3. Option three does away with the exception by allowing offsite in all cases. This is definitely not the intent.

2. An exception in C411.1 is an exception from the subsections. Buildings qualifying for C411.1 exceptions do not have to comply with C411.1.1 but the intent is that it will. Added link in exceptions in options 1 and 2 to force compliance with C411.1.1.

3. C411.1.1.1 requires an extra 18 credits. This was on the assumption the C406 only allowed on-site solar. But C406 now allows off-site and it only takes 0.15W/sf-0.3W/sf of on-site or off-site solar to achieve 18 credits depending upon occupancy. The intent was for the 18 credits to be equivalent to 0.5W/SF. Option 1 eliminates the C406 linkage and requires exception qualifying buildings to install 0.5W/sf off-site. Option 2 leaves the C406 link with 18 credits. That could be kept or made to be equivalent by changing it to "must achieve additional efficiency packages credits equivalent to 5 times the credits listed in Table C406.2 for item 14 Renewables"

4. C411.1.1.2 is addressing how C406 treats renewables. Language in C406 can, and does, limit C406 to solar over the C411.1 requirement. Language here doesn't really have force in another section - or at least it is not done elsewhere in the code.]



[Option 1 Require On-site - Add exception for buildings not qualifying for exception 2 that don't have room for all the solar so they don't have to model. Change additional efficiency credits to an 0.5W/sf off-site. This is probably closest to the original intent.]

WAC 51-11C-41100 Section C411—(~~(Solar readiness-)~~) **Renewable energy.** C411.1 (~~(General-)~~) **On-site renewable energy.** Each new building, or addition larger than 10,000 square feet of gross conditioned floor area, shall include a renewable energy generation system consisting of not less than 0.5 W/ft<sup>2</sup> or 1.7 Btu/ft<sup>2</sup> multiplied by the sum of the gross conditioned floor area.

**EXCEPTIONS:**

1. Any building where more than 50 percent of the roof area is shaded from direct beam sunlight by natural objects or by structures that are not part of the building for more than 2500 annual hours between 8:00 a.m. and 4:00 p.m. and that comply with Section C411.1.1.
2. Any building where more than 80 percent of the roof area is covered by any combination of equipment other than for on-site renewable energy systems, planters, vegetated space, skylights or occupied roof deck and that comply with Section C411.1.1.
3. Buildings which can document they do not have adequate roof area to install the required on-site solar and that comply with Section C411.1.1 may install a lesser amount, of on-site renewables but not zero.
3. Alterations that do not include additions.

**Commented [MK1]:** Requires projects to document they do not have adequate roof area and requires them to still install some on-site with the rest being off-site

**C411.1.1.1 ~~Additional efficiency credits~~Off-site renewable energy.**

~~C411.1.1.1 On-site renewable energy reduced.~~ Buildings which qualify for one of the exceptions in Section C411.1 ~~to omit installation of on-site renewable energy~~ must provide qualified off-site renewables in accordance with C411.1.2 so the total on-site and qualified off-site renewables is not less than 0.5 W/ft<sup>2</sup> or 1.7 Btu/ft<sup>2</sup> multiplied by the sum of the gross conditioned floor area. ~~achieve an additional 18 efficiency package credits from Table C406.2.~~

~~C411.1.1.2 On-site renewable energy capacity increased.~~ Buildings which install PV systems which exceed the capacity requirements of Section C411.1 may achieve additional efficiency package credits as described in Section C406.2.5.

~~C411.1.1.3 Partial capacity.~~ On-site renewable energy installations of lower than required capacity can be counted proportionally toward achievement of required or additional efficiency credits in Section

**Commented [MK2]:** Changing this to off-site renewables directly simplifies the process and allows C411.1.1.3 to be deleted and this section to become C411.1.1.

~~C411.1.1 based on the capacity of renewable energy installed compared to the requirements of Section C411.1.~~

**[End of C411.1 Option 1]**

**[Option 2 - would be to keep the existing proposed language mostly intact. Buildings with not qualifying for exception 2 that cannot install the required solar will need to comply via C407. If the 18 extra credits are unchanged buildings qualifying for the exceptions would only need 0.15W/sf to 0.30W/sf of renewables to meet the extra credits value. This would also be close to the original intent.]**

**WAC 51-11C-41100 Section C411—((~~Solar readiness~~)) Renewable energy. C411.1 ((~~General~~)) On-site renewable energy. Each new building, or addition larger than 10,000 square feet of gross conditioned floor area, shall include a renewable energy generation system consisting of not less than 0.5 W/ft<sup>2</sup> or 1.7 Btu/ft<sup>2</sup> multiplied by the sum of the gross conditioned floor area.**

**EXCEPTIONS:**

1. Any building where more than 50 percent of the roof area is shaded from direct beam sunlight by natural objects or by structures that are not part of the building for more than 2500 annual hours between 8:00 a.m. and 4:00 p.m. and that comply with Section C411.1.1.
2. Any building where more than 80 percent of the roof area is covered by any combination of equipment other than for on-site renewable energy systems, planters, vegetated space, skylights or occupied roof deck and that comply with Section C411.1.1.
3. Alterations that do not include additions.

**C411.1.1 Additional efficiency credits.**

~~**C411.1.1.1 On-site renewable energy reduced.**~~ Buildings which qualify for one of the exceptions in Section C411.1 to omit installation of on-site renewable energy must achieve an additional 18 efficiency package credits from Table C406.2].

~~**C411.1.1.2 On-site renewable energy capacity increased.**~~ Buildings which install PV systems which exceed the capacity requirements of Section C411.1 may achieve additional efficiency package credits as described in Section C406.2.5.

**Commented [MK3]:** 18 credits can be achieved by ~ 0.15W/sf of renewables in C406. Consider requiring more via this language: "must achieve additional efficiency packages credits equivalent to 5 times the credits listed in Table C406.2 for item 14 Renewables"

~~C411.1.1.3 Partial capacity.~~ On-site renewable energy installations of lower than required capacity can be counted proportionally toward achievement of required ~~or additional efficiency credits in Section C411.1.1~~ based on the capacity of renewable energy installed compared to the requirements of Section C411.1.

[End C411.1 Option 2]

[Option 3 - deal with all issues by allowing off-site. The simplest fix as all exceptions as well as addition efficiency credits (and the problems that were in that section) can be deleted. It also resolves fairness issue with C407 which can use offsite instead of on-site (depending upon interpretation of C411 - solar readiness]. But it is clearly not the TAG intent]

WAC 51-11C-41100 Section C411—(~~(Solar readiness.)~~) Renewable energy. C411.1 (~~(General.)~~) On-site renewable energy. Each new building, or addition larger than 10,000 square feet of gross conditioned floor area, shall include a renewable energy generation system consisting of not less than 0.5 W/ft<sup>2</sup> or 1.7 Btu/ft<sup>2</sup> multiplied by the sum of the gross conditioned floor area. Off-site renewable energy shall be permitted to substitute for part or all of this on-site renewable requirement in accordance with Section C411.2.

EXCEPTIONS: 1. Any building where more than 50 percent of the roof area is shaded from direct beam sunlight by natural objects or by structures that are not part of the building for more than 2500 annual hours between 8:00 a.m. and 4:00 p.m. and that comply with Section C411.1.1.1.  
2. Any building where more than 80 percent of the roof area is covered by any combination of equipment other than for on-site renewable energy systems, planters, vegetated space, skylights or occupied roof deck and that comply with Section C411.1.1.1.  
3. Alterations that do not include additions.

~~C411.1.1 Additional efficiency credits.~~

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~~C411.1.1.2 On-site renewable energy capacity increased. Buildings which install PV systems which exceed the capacity requirements of Section C411.1 may achieve additional efficiency package credits as described in Section C406.2.5.~~

~~C411.1.1.3 Partial capacity. On-site renewable energy installations of lower than required capacity can be counted proportionally toward achievement of required or additional efficiency credits in Section C411.1.1 based on the capacity of renewable energy installed compared to the requirements of Section C411.1.~~

[End C411 Option 3]

[Start of suggested changes to C411.2 and C411.3]

**C411.2 On-site and off-site renewable energy accounting for use with Appendix G.** Qualifying on-site and off-site renewable energy delivered or credited to the building project to comply with this codeSection ~~C407.3 item 2.2~~ shall meet the requirements of this section.

Renewable energy certificates for an on-site or off-site renewable energy system shall be retired on behalf of the building owner for a period of not less than 15 years and tracked in accordance with Section ~~C407.3.2.3~~ C411.2.3 and submitted to the code official as part of the permit application.

**C411.2.1 Qualifying types of off-site renewable energy systems.** The following are considered qualifying off-site renewable energy systems:

~~1. Systems connected to the Western Interconnection.~~

~~21.~~ Self-generation (an off-site renewable energy system owned by the building project owner) systems complying with Section ~~C407.3.2.2~~ C411.2.2.

~~32.~~ Community renewable energy facility systems complying with Section ~~C411.2.2~~ C407.3.2.2.

~~43.~~ Purchase contracts complying with Section ~~C411.2.3~~ C407.3.2.3.  
~~5.~~

**Commented [MK4]:** Rewrite to remove all references to Appendix G and C407. This section is used by C406 too and depending upon the chosen optional language above, C411.1.

Also, what in this section applies to onsite? Does REC retirement per C411.2.3 apply to C407 onsite?

**Commented [MK5]:** There is no section C407.3.2.3. Pretty sure this reference should be C411.2.3 and that C407.3.2.2, where it occurs, should be C411.2.2

**Commented [MK6]:** The list that follows contains two items that are requirements of the system rather than separate qualifying systems. They are moved to follow the list.

**Commented [MK7]:** This would allow ANY off-site renewable system. Is the intent that resources qualifying for items 2, 3, and 4 in this list must be on the western interconnection?

Each source of renewable energy delivered to or credited to the building project shall be connected to the Western Interconnection and energy or capacity multiplied by the factors in Table C407.3.2.1C411.2.1 and subtracted from the proposed building site energy use.

**Commented [MK8]:** This is a requirement of the system not a type of qualifying system. Seems like this should be not part of the numbered list.

**Commented [MK9]:** This is not appropriate in this section. It will not play nice with C406. Move to C407.

**Commented [MK10]:** This seems like it would be a capacity calculation but then subtracting from proposed energy in C407 is an energy calculation. How does this work?

**Commented [MK11]:** C411.2.1?

**Table C411.32.1**

**Multipliers for Renewable Energy Procurement Methods**

<u>Location</u>	<u>Renewable Energy Source</u>	<u>Renewable Energy Factor</u>		
		<u>In the state of Washington</u>	<u>Western Interconnected</u>	<u>In the states of Oregon or Idaho</u>
On-site	On-site renewable energy system	1	NA	NA
Off-site	Directly owned off-site renewable energy system that begins operation after submission of the initial permit application	0.95	0.75	0.85
Off-site	Community renewable energy facility that begins operation after submission of the initial permit application	0.95	0.75	0.85
Off-site	Directly owned off-site renewable energy system that begins operation before submission of the initial permit application	0.75	0.55	0.65
Off-site	Community renewable energy facility that begins operation before submission of the initial permit application	0.75	0.55	0.65
Off-site	Renewable Power Purchase Agreement (PPA)	0.75	0.55	0.65

**C411.3 Solar readiness.** A solar zone shall be provided on nonresidential buildings that are 20 stories or less in height above grade plan. The solar zone shall be located on the roof of the

building or on another structure elsewhere on the site. The solar zone shall be in accordance with [this section](#)~~Sections C411.2 through C411.8~~ and the *International Fire Code*.

**Commented [MK12]:** Link fix. Really shouldn't have subsections referenced here. Perhaps it should be: in accordance with this section and the ifc.

Or could have Sections C411.3.1 through C411.3.7